

Topic: Dividing scientific notation**Question:** Rewrite the expression in scientific notation.

$$(9.88 \times 10^{12}) \div (2.6 \times 10^{-3})$$

Answer choices:

- A 3.8×10^{15}
- B 2.6×10^{-15}
- C 3.8×10^{-15}
- D 4.7×10^{14}



Solution: A

The given expression is

$$(9.88 \times 10^{12}) \div (2.6 \times 10^{-3})$$

First, we divide the decimal numbers and the powers of 10 separately, remembering to subtract the exponents in the latter division.

For the division of the decimal numbers, we get

$$9.88 \div 2.6 = 3.8$$

Dividing the powers of 10:

$$10^{12} \div 10^{-3} = 10^{12-(-3)} = 10^{12+3} = 10^{15}$$

Next, we multiply the results of those two divisions.

$$3.8 \times 10^{15}$$



Topic: Dividing scientific notation**Question:** Rewrite the expression in scientific notation.

$$(1.554 \times 10^{-6}) \div (2.1 \times 10^5)$$

Answer choices:

- A 3.3×10^{-11}
- B 0.74×10^{-12}
- C 3.3×10^{11}
- D 7.4×10^{-12}



Solution: D

The given expression is

$$(1.554 \times 10^{-6}) \div (2.1 \times 10^5)$$

First, we divide the decimal numbers and the powers of 10 separately, remembering to subtract the exponents.

For the division of the decimal numbers, we get

$$1.554 \div 2.1 = 0.74$$

Dividing the powers of 10:

$$10^{-6} \div 10^5 = 10^{-6-5} = 10^{-11}$$

Next, we multiply the results of those two divisions.

$$0.74 \times 10^{-11}$$

The number we just found (0.74×10^{-11}) isn't in proper scientific notation, because in 0.74 the digit to the left of the decimal point is 0.

To take care of that, we'll express 0.74 in proper scientific notation. To get just one nonzero digit to the left of the decimal point, we have to move the decimal point one place to the right, so the exponent will be -1 .

$$0.74 = 7.4 \times 10^{-1}$$

Finally, we'll multiply 7.4×10^{-1} by the result of the division of the powers of 10 (by 10^{-11}), so we need to add the exponents.



$$(7.4 \times 10^{-1}) \times 10^{-11}$$

$$7.4 \times (10^{-1} \times 10^{-11})$$

$$7.4 \times 10^{-1+(-11)}$$

$$7.4 \times 10^{-1-11}$$

$$7.4 \times 10^{-12}$$



Topic: Dividing scientific notation**Question:** Rewrite the expression in scientific notation.

$$\frac{(0.04 \times 10^{-9}) (50 \times 10^{10})}{(0.0000004)(50,000)}$$

Answer choices:

- A 1×10^2
- B 10^8
- C 2×10^8
- D 100



Solution: A

If we start with the given expression

$$\frac{(0.04 \times 10^{-9})(50 \times 10^{10})}{(0.000004)(50,000)}$$

we'll first work on the numerator separately from the denominator. And when we're working inside the numerator or inside the denominator, when we multiply numbers in scientific notation, we multiply the decimal terms together.

$$\frac{0.04 \cdot 50 \times 10^{-9} \cdot 10^{10}}{0.000004 \cdot 50,000}$$

$$\frac{2 \times 10^{-9} \cdot 10^{10}}{0.2}$$

Then we'll multiply the powers of 10 together, adding the exponents when we do that.

$$\frac{2 \times 10^1}{0.2}$$

Now that we've somewhat simplified the numerator and denominator, we'll divide the decimal terms, and then separately divide the powers of 10.

$$\frac{2}{0.2} \times 10^1$$

$$10 \times 10^1$$



Now we have to put this answer into proper scientific notation. To change the 10 decimal term into proper scientific notation, we need to move the decimal point one place to the left.

$$1.0 \times 10^1$$

But because we made the decimal term smaller, we have to make the 10 term larger. We moved the decimal point one place, so we need to increase the exponent by 1.

$$1.0 \times 10^2$$

Drop the 0 from the decimal term since it's not a significant figure.

$$1 \times 10^2$$

